

432 MHz AND ABOVE EME NEWS

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EME NETS

14.345, 10 AM ET SATURDAYS, AFTER VARO NET SUNDAYS:

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CONDITIONS

Feb turned out to be a great month whether you operate on 1296 and participated in the SSB Contest, are only active on 70 cm, or work microwave EME. The full spectrum was well-represented activity wise; there was something for everyone! Initials were made on 3, 6 and 13 cm during Feb, and activity was high on 432. I did not find conditions exceptional on 23 cm, but they were good enough to produce plenty of SSB QSOs. I think there is still some confusion over the SSB Contest rules and operating time. This resulted in some spillover 1296 SSB activity on Sunday. The point of the contest was to provide a goodtime to all who participated, and I think this was achieved.

HIGH SSB CONTEST SCORES

I still do have scores from all the major players. At present it appears that HB9Q is the winner of the coveted framed contest certificate. Dan has 550 points, but there are several potential winners from whom scores have not yet been received. I will wait until the April NL to finalize the winner. Other high scorers include G4CCH in 2nd place with 440 points, K2UYH with 370 points and OZ6OZ with 312 points.

AL7OB

Mike had a disaster on 70 cm during the Feb SW -- Unbelievable bad luck, I had good echoes on Thursday night and everything looked good, but on Friday everything broke: The AZ drive shaft, the chain, axel drive, my computer, the AZ position indicator... I had everything fixed for Saturday, but then my 2nd stage preamp died... and the tuning dial of my FT-767 started getting tight and completely seized. The antenna system is now working great, and the echoes are awesome! The end result was nil on all skeds, but I did manage to work EA8FF (439/549) for initial #59, W1ZX (O/O) #60, NC1I (569/569), VK4AFL (559/559) and JH4JLV (449/449) #61 - all random. After the SW I added SM3AKW (559/559), OZ6OL (439/539) #62, UA3PTW (O/O) #63, NC1I (579/579), N9AB (O/559) – using only 100 W, DL8OBU (449/449) #64, K4EME (449/449) #65 and UA9FAD #66. I am looking for SKEDS!

DL6LAU

Carsten is basically QRV on 13 cm. He has installed his xvrter and PA (200 W). All seems to be fine. He planned to try for some random QSOs during the Feb SW. He can only TX on 2320, but can listen on 2320 and 2304. He has no 2424 RX yet.

He is not sure about the offset between his 2 converters and asks stations to please tune around on 2320.

F1ANH

Jean Pierre had some nice QSOs on 6 cm, on 3 Feb OK1KIR (O/O), on 4 Feb W5LUA (O/O) and on 11 Feb ZS6AXT (O/O). Jean Pierre notes that skeds are always welcome and suggests emailing him at f1anh@wanadoo.fr. He reports that the annual VHF, UHF & Microwaves Convention will take place at SEIGY on 31 March/1 April. This year a 70 cm EME demonstration station will be active for random QSOs. For more information contact [here](#).

F2TU

Philippe joined the SSB Contest on 1296 with good results. He QSO'd at 1635 G4CCH (55/56) IO, 1637 HB9Q (56/54) JN, 1638 OE9ERC (57/56) JN, 1651 I0UGB (53/53) JN62bo, 1703 GW3XYW (53/43) IO, 1940 N2IQ (55/55) FN, 2025 OK1UWA (43/54) JN, 2040 K5JL (55/55) EM, 2055 OK1KIR (43/43) JN, 2059 K2DH (54/54) FN, 2115 K2UYH (43/55) FN, 2125 OZ6OL (53/54) JO. 2133 LX1DB (56/56) JN, 2155 KA0Y (55/55) EN, 2230 K0YW (55/44) DM, 2325 K4QI (54/55) FM and 0035 W5LUA (55/55). All QSO were on SSB for a score of $17 \times 8 \times 2 = 272$ points. Also heard WA9OUU (44), W2UHI (44) and F1PYR (549). On 5760 Philippe QSO'd on 3 Feb OK1KIR (O/O) for initial #6 and on 10/11 Feb ZS6AXT (539/559) #7 and 1st F/ZS on 6 cm. He is building a new PA with 30 W out, and is getting very fine echoes peaking 20 dB. Philippe will be QRV on 3/4 March on 5760 and can be contacted for skeds at email: [F2FU](#).

G4CCH

Howard reports on the SSB Contest -- I managed to make 21 contest QSOs in 10 sectors for a score of $(20 \times 2 + 1 \times 1) \times 10 = 410$ points. Activity was not as high as I expected especially in Eur with many of the "big guns" noticeably absent. I managed to work at 1445 OK1UWA JN (53/54), OE9ERC JN (57/56), HB9Q JN (57/54), F1PYR JN (43/44), GW3XYW IO (53/53), OZ6OL JO (54/54), F2TU JN (56/55), HA5SHF JN (529/559) CW only, N2IQ FN (56/55), W2UHI EN (54/54), OK1KIR JN (42/44), K4QI FM (54/55), K5JL EM (56/56), LX1DB JN (57/56), K2UYH FN (55/55), KA0Y EM (55/55), WA9OUU EN (55/55), W7BBM DM (429/55) for initial #145, VE6TA DO (42/44), WA9FWD EN (42/44), W5LUA EM (54/55) and W7SZ CN (42/42). Gotaways were I0UGB, HA5SHF (only strong enough for CW), VE6NA and LU8EDR.

GW3XYW

Stu reports -- Activity for the 23 cm contest was good with moderate Eur participation. Some big guns were not copied, maybe due to WX problems in parts of Eur. Stations worked (all on 23 cm SSB) were HB9Q JN (54/53), G4CCH IO (53/53), F2TU JN (43/53), OE9ERC JN (56/55), OZ6OL JO (52/52), N2IQ FN (55/55), I0UGB JN (52/53), W2UHI EN (52/53), K5JL EM (55/56), K4QI FM

(43/43), LX1DB JN (56/56), K0YW DM (55/55), KA0Y EN (54/54), WA9OUU EM (53/53), K2UYH FN (53/53) and CWNR HA5SHF (on SSB and CW) for a total of $15 \times 2 \times 8 = 240$ points.

HA5SHF

Csaba, HA5BGL operated the EME SSB Contest with HA5BMU. They used their 3 m solid dish, YD 1270 PA giving 100 W at the feed and FHX 35G LNA with TimeWave 59+ filter. QSO'd on 3 Feb at 1748 OE9ERC (57/33) JN, 1804 HB9Q (57/41), 1947 N2IQ (57/439) FN (SSB/CW), 2144 K5JL (57/549) EM (SSB/CW) and 2330 LX1DB (57/559) JN (SSB/CW) for a total $(2 \times 2 + 3 \times 1) \times 3 = 21$ points.

HB9Q

Dan, HB9CRQ had a good time in the SSB Contest and submits the following results – He operated single op and worked 27 stations on SSB and one on mixed. All QSOs were on random and were as follows: 1304 OZ6OL JO (53/54), 1311 I0UGB JN (42/54), 1316 OK1UWA JN (41/55), 1427 F1PYR JN (41/55), 1505 G4CCH IO (54/56), 1510 OE9ERC JN (56/57), 1510 GW3XYW IO (53/54), 1636 F2TU JN (54/56), 1718 PA3DZL JO (41/51), 1800 HA5SHF JN (41/55), 1903 N2IQ FN (55/58), 1917 IK2MMB JN (53/54), 1931 OK1KIR JN (42/43), 2017 K4QI FM (54/54), 2027 K2DH FN (54/57), 2029 K5JL EM (55/58), 2037 WA9FWD EN (41/55), 2045 W2UHI EN (53/56), 2052 LX1DB JN (56/57), 2100 K2UYH FN (41/55), 2109 KD5FZX EM (54/54), 2112 VE6TA DO (53/55), 2123 KA0Y EN (55/57), 2136 WA9OUU EM (53/55), 2156 K0YW DM (55/56), 2228 W7SZ CN85 (42/54), 2325 W7BBM DM (419/55) SSB/CW and 0040 W5LUA EM (53/56) for a score of $(27 \times 2 + 1 \times 1) \times 10$ or 550 points. Dan plans to be QRV on 432 during the 3/4 March SW.

I0UGB

Giuseppe took part in the 1296 SSB Contest on the 3 Feb -- I contacted with very good signals HB9BQ, F2TU, OE9ERC, GW3XYW, K5JL, LX1DB, K0YW and N2IQ for a score of $8 \times 2 \times 5 = 80$ points. I heard another 5 stations. I did not hear WA1JOF with whom I had a sked.

K0YW

Bruce got on late for the SSB Contest, but made 25 QSOs in the contest. Activity and sigs were good. Bruce worked 3 initials I0UGM #86, W7BBM #87 (one of 2 SSB/CW QSOs – John had only 17~25 W) and KD5FZX #88. He also worked ZS6AXT (569/579) and DF4PY (569/569) #89.

K1FO

Steve was only able to be QRV for a few hours during the Feb SW. QSOs on 432 were on 2 Feb with OH2DG, EA3DXU, G4ERG, RA3LE and DL9NDD, on 3 Feb with K5WXN, G3HUL, SM2CEW, I5CTE, SM3AKW, UA6LGH, K4EME and W7CI whom was running only 50 W, on 4 Feb with G4YTL, EA3DXU, W1ZX,

EA8FF and UA3PTW, on 10 Feb EA8FF and K5WXN, and on 11 Feb N9AB. Conditions were very good over the SW. On 10 Feb there was almost no polarity distinction. At times there was only about a 3 dB change in strength no matter which way polarity was turned. Steve says it was good to hear Marc, EA8FF QRV again with good signals from his relatively small array. Back on 3 Jan He QSO'd N1BUG for initial #588.

K3AX

Harry is going QRT on EME -- It appears that I will be leaving EME. Several factors including moving from my current QTH and not so good health are all happening at once. I have decided to sell the large solid-state 23 cm amp that I have been using on EME. Its a 5 1/4" RF deck made from 16 Mitsubishi M57762 power modules driven by a single M57762 (1/4 W drive) and yields 225 W into a good load. I run VCC at 14.2 Vdc. It requires a stiff 80 A or better dc supply. I am using 2 x 50 A Astrons in parallel. It was an exercise in power dividing and combining that worked well. It might just be the thing to use as an IPA for a big tube. Although, it yielded #91 initials as a final PA for me. Anyone interested can call for more details. W4TJ has expressed an interest in my 4.4 m dish, feed, and accessories; however, should he not want it, these items will also have to be put on the block. The mesh is good to Ku band. My [email](#) and my phone number is 610-777-2265. My location is SE PA.

K4QI

Russ writes – I was on for the 1296 SSB Contest, but was not able to spend a lot of time. The following were worked: HB9Q, GW3XYW, K5JL, G4CHH, LX1DB, OE9ERC, K2DH, KA0Y, WA9OUU, K0YW, K2UYH and F2TU for 12 QSOs in 6 multipliers or 144 points. Conditions seemed pretty good with not much libration. I worked almost everything I heard in the 3 hours I was on. I only missed W2UHI and W7SZ.

KL7HFQ

Roger worked in Feb on 432 K5WXN, NC1I and K4EME, but did not QSO WB0GGM. He heard AL7OB calling W1ZX, EA8FF and others. He notes observing strange EME conditions where he can hear stations while Mike, AL7OB can't and vice verse. [Could these copy differences be due to polarization alignment differences between the 2 of you?]

LU8EDR

Dany is QRV again on 1296 with his new 7.2 m dish and 40 W. During the SW he initially has some LNA problems, but was able to fix everything. He worked prior to the SSB Contest KA0Y and K5JL, and during the contest the following day OE9ERC on 2-way SSB.

N1BUG

Paul running on 70 cm with a single yagi on the horizon is having good results. Although during the Feb SW he was not too successful. He heard PA3CSG for the 1st 3 periods, but nothing after that in 45 minutes. He also messed up just before his DL9NDD sked and was not able to TX. Paul says it was his error and sends his apology. In post SW skeds he worked DL4MEA, but only a partial with DL9NDD and nil from AL7OB and EA8FF.

NC1I

Frank was QRV again on 70 cm in Feb -- This month I made it a priority to be active off the moon whenever possible. Conditions over the SW were mixed. QSB seemed more evident than usual and polarity seemed "mushy" most of the time. It was difficult to find a pol peak on many stations. NA and Asian/Pacific activity seemed sparse. The following stations were logged: on 2 Feb at 2230 OZ6OL (559/569) and 2236 RA3LE (559/569), on 3 Feb at 0324 K4EME (559/579), 0350 K5AZU (579/579), 0404 K5WXN (559/559), 0435 WB0GGM (449/559), 1949 SM2CEW (579/579), 1957 DL8OBU (549/559), 2019 CT1DMK (439/559), 2027 I5CTE (559/559), 2038 OE3JPC (449/559), 2048 UA3PTW (539/569), 2059 DL9NDD (569/579), 2320 DJ3FI (559/559), 2335 UA6LGH (559/569) and 2345 G4YTL (559/559), on 4 Feb at 0003 W7CI (539/579), 0018 SM3AKW (569/579), 0433 K5WXN (559/569), 0505 AL7OB (569/569) - Mike's system appears to be working FB, 0552 VK4AFL (569/579), 0600 JH4JLV (559/559) and 2052 DL8OBU (559/559), on 5 Feb at 0154 UA3PTW (439/569), 0213 EA8FF (569/559) – nice to find these 2 stations calling CQ at this time, 0230 AL7OB (579/579) and 0246 KL7HFQ (559/549), on 6 Feb we received an incredible (and record breaking) 28" of snow in just 11 hours, on 7 Feb at 0112 K4QI (569/569) and 0204 DL8OBU (559/569), and on 9 Feb at 0340 AL7OB (569/559). I had intended on being active during the post SW but unfortunately we experienced high winds all weekend and I was reluctant to untie the array.

NU7Z

Rick report's on the status of his 5760 EME project -- I have been hearing well with increased moon noise, so the receiver is working ok. To my chagrin, though, I found that I have no TX. At 1st I thought it was the TWTA. But it seems that I have lost the control cable for TX/RX, Hydraulics on/off, and my AZ/EL control. The cable is buried under my house and 100' long. So, when things settle down I will be out rebuilding the control circuits. I want to update the Microwave EME Directory and need input from everyone to keep the list accurate. Please include your email address.

OZ4MM

Stig writes -- Again this month I couldn't operate the SW due to a combination of family commitments and high winds. During the week after the SW while checking the on 432, I found G4ERG and exchanged (549/559). No others were heard that night at 432. On Saturday, 10 Feb I had tried to set up some skeds on

13 cm. Paul, WA6PY was worked (429/449) for initial #34. I am vestergaard@adr.dk looking for 13 cm skeds for the March SW, if someone is interested?

OZ6OL

Han's SSB Contest report – We had bad WX with strong wind and snow. Despite the WX, I QSO'd on 3 Feb at 1304 HB9Q (54/53) JN47, 1623 G4CCH (54/54) IO93, 1819 OE9ERC (55/54) JN47, 1833 GW3XYW (52/52) IO71, 1911 N2IQ (55/44), FN13, 2059 LX1DB (55/55) JN39, 2111 K5JL (55/54) EM15, 2117 K2DH (54/54) FN13, 2133 F2TU (54/53) JN38, 2347 K0YW (56/55) DM67, 2351 KA0Y (55/54) EN41 and 2355 K2UYH (52/53) FN20, and 4 Feb at 0045 W5LUA (54/54) EM14 for a score of $13 \times 2 \times 6 = 312$ points. I also contacted on 23 cm on 6 Jan HA5SHF, G3LTF, WA1JOF and ZS6AXT, on 7 Jan K0YW, KA0Y, W7GBI and OE9ERC, on 8 Jan W4AD, VE6TA, K9BC and W6HD, on 9 Jan K0YW, DJ9YW, I0UGB and SM6CKU, on 28 Jan G4CCH and SM2CEW, on 2 Feb KA0Y and on 4 Feb SM2CEW, ZS6AXT and IK2MBB (from HB9SV's QTH).

OK1KIR

Tonda, OK1DAI reports that he and OK1DAK operated their club station during the EME SSB Contest. They QSO on 3 Feb at 1932 HB9Q (43/42) JN, 1936 OE9ERC (44/44) JN, 2008 N2IQ (54/54) FN20, 2022 G4CCH (44/44) IO, 2050 F2TU (43/43) JN, 2112 LX1DB (54/54) JN, 2132 K5JL (54/53) EM, 2256 K0YW (54/54) DM and 2340 KA0Y (54/52) EN for initial #184. All QSOs were on 2-way SSB. They ended with a score of 6×18 for 108 points. Heard on SSB were OK1UWA, GW3XYW and K2DH. Before the contest they completed their conversion from 75 to 50 ohm and eliminated that last piece of 75 ohm cable. The results were even better than expected... As Tonda put it " ... It was like you put a new outstanding piece in an old car." On 1296 they QSO'd on 10/11 Dec #177, K0YW #178, W2UHI, K5JL, G4CCH, K5GW #179, W7SZ, WA6PY #180 and DL6LAU #181, heard were OZ6OL, VE6TA and WA1JOF, in the Jan SW WA1JOF (429/529) #182, and in the Feb SW before the contest OK1UWA (O/O) #184, and heard IK2MMB, ON5RR, GW3XYW, K2DH, VE6TA and VE6NA. On 5760 we worked on 3 Feb 3 at 1405 F2TU (O/O) for initial #16 and the 1st F/OK QSO on 6 cm and 1501 F1ANH (O/O) #17. Nil was copied in sked with OH2AXH. A circular pol feed was used in all skeds that delivered 1.4 dB of moon noise and CS/G noise of 4.5 dB. On 10368 we have improved our system and now have 20 W at the WG rotatable linear feed from a new TWTA. This produces good consistent echoes on at least (O) level. The Moon noise was measured at 1.8 ~ 1.9 dB on Feb 7 with the same old 3.7 m dish., HB9BHU was so kind to switch on at 2031 and we easily QSO'd (O/M) for initial #14.

PA0PLX

Jan has concluded he had antenna problems during the Jan SW -- I only copied NC1I. Since Jan I have only heard NC1I and surprisingly DL9NND. I climbed the

roof and opened some of the dipole boxes. I found water as well as melted support parts. This surely did not contribute to a good performance, although the VSWR has not changed? I have to solve this water penetration problem very soon. I now have my WEB-site up at:

[PA0PLY's WEB Site](#)

[PA9KT](#)

Timon (JO33j) is working on coming up on 23 cm EME, and eventually also 10 GHz -- I have a 3 m Al dish and want to put it up. I am interested in possible mount designs. [Try contacting PA3CSG.] I would like to know if a PST71 rotator (8.8 m2, rotating torque 42 kg-cm, breaking torque 52.325 kg- cm and vertical load 1.450 kg) can handle my dish? [Timon can be contacted at [PA0KT email](#) or

[PA0KT's WEB site](#)

[S57UUU](#)

Marko s57uuu@hamradio.si writes -- I wasn't QRV for the autumn contest because WX was very bad both weekends. On the 2nd contest weekend the heavy rain even caused a big landslide 80 km from here that killed 6 people. The winds were also high, but my dish survived for now (knock on wood). My next planned 3 cm activity will be for the DUBUS spring contest. [Marko also sent in comments on circular pol – see the Technical section of this NL.]

[SM2CEW](#)

Peter reports excellent conditions both on 432 and 1296 during the Feb SW -- On 432 I worked UA6LGH, VK4AFL, DK3WG, JH4JLV, RA3LE, DL9NDD, I5CTE, K1FO, OH2DG, NC1I, K4EME, OE3JPC, UA3PTW, SM3AKW, G3HUL, WB0GGM, KJ7F and UA6LGH again. I listened to N1BUG running with PA3CSG. Signals were again very good from Paul, with a pronounced peak at 6-8 degs elevation at his end. On 1296 I did not enter the SSB Contest as I run my amplifiers in class C. I came on Sunday night for some CW QSOs and worked OE9ERC, DJ5MN, OZ6OL, F5PL, ZS6AXT and IK2MMB/HB9SV (huge signal!). Everything worked well over the weekend and I was pleased to see the dish track properly at -30 degs C temperature.

[SM3AKW](#)

Carl has been working on his 2.3 GHz system and was happy to test it on 3 Feb – I QSO'd at 2000 ZS6AXT (559/559), 2320 OE9XXI (569/559), 2330 OE9ERC (579/559) and 2335 HB9SV (559/559), on 4 Feb WA6PY (M/M) on sked, and 10 Feb JA4BLC on 2304/2424. I did not take part in the SSB Contest mainly due to my efforts on 13 cm. On 432 I worked on 3 Feb at 2100 SM2CEW, 2110 K1FO, 2127 UA6LGH, 2138 K5WXN, 2145 G4ERG and 2155 G3HUL, on 4 Feb at 0019 NC1I, 0056 G4YTL, 1407 VK4AFL, 2354 OZ6OL, 2358 UA3PTW, and on 5 Feb

at 0033 AL7OB with a booming signal!

SK7MW

Tor expects to be QRV very soon on EME both on 144 and 432 MHz. He is interested in operating procedure, and can be reached at [Tor's email](#) [See G3SEK's Procedures at the end of the Jan 2001 NL].

VK3UM

Doug is making progress on his dish – I had a good day re-counter balancing the dish. It was a remarkable day in that there was hardly a breeze. It required 480 kg to get balance and provide enough back force to get the hydraulics to bring the dish off the horizon. We had 2 x 60 liters oil drums of concrete (3 x 40 kg bags) and had to add another 2 x 60 liters in rubbish bins! A friend is going to weld a couple of 60 and 20 liter cans together to replace the rubbish bins. Its not presently a real pretty sight, but it works! I ordered a garden shed for the 'dish shack'. I expect to have it completed in 3 weeks. I will then have to extend the cables and ducting to it. I also have to build a dish feed platform as the feed point is 18' off the ground. It is fun to wave the dish around. The gearing and speed control work great. The Az motor (20 V @ 85 A) is PWM controlled. El is hydraulic and uses a HP single phase electric motor. One of the digital 0.5° sensors is fitted (El) ready to be cabled. There is no backlash and even when tipped over the dish needs a hell of a shove to see the slightest movement. The sheer size and weight of the installation has me a little edgy. It will take time for me to gain confidence in the system.

VK4AFL

Trevor writes -- Activity on 432 has been fairly good with initials ON5OF, KA0Y, WB0GGM and UA6LGH in recent weeks. Conditions have been typically quite variable especially during the Feb SW. Faraday ranged from zero to 90 degs over short periods of time. I worked AL7OB with his new dish [good picture of it on his web site] and a hugely improved signal over the previous yagi array. With spring approaching in the Northern hemisphere, I look forward to increasing activity. I can usually make myself available outside of weekends for any tests, skeds, etc. I feel there are many suitable days each month that are under utilized.

W1ZX

Willie was on 70 cm the past SW. He worked on 4 Feb at 0000 PA4FP – very good (O) signal, but Frank didn't hear Willie, 0030 G4YTL (339/O) for initial #300, 0145 K1FO (579/579), 0259 AL7OB (339/O) #301 and 0530 VK4AFL (O/O) - very good signal #302. Willie had good echoes all evening. He will be back on 23 cm in a month or two. For skeds on 70 cm, [Willie, W1ZX email](#).

W7HAH

Shep has serious health problems and will shutting down on 70 cm shortly. He

wants to provide Montana to all that need his rare state before he is QRT. Stations wanting skeds should contact him at email w7hah@montana.com. Shep worked on 7 Jan N2IQ, on 8 Jan DF3FI for initial #220, on 10 Jan KJ7F #221, and on 27 Jan W7SZ #222.

W7SZ

Larry writes -- Thanks to the "big" stations I had a good time during the 23 cm EME SSB Contest. The following contacts were made all via SSB/SSB: OE9ERC, HB9Q, KA0Y, K0YW, G4CCH, N2IQ, W6HD, K2UYH and K5JL for a score of $9 \times 2 \times 7 = 126$ points. Prior to the contest I worked W7HAH on 70 cm for new State and had a 2nd "FSK" QSO with W7LHL on 23 cm. [See the Technical report on this ground breaking QSO promised last month at the end of this NL.]

WA6PY

Paul has moved to 13 cm – I QSO'd on 11 Jan WA1JOF in an extra sked on 1296. For the 3/4 Feb SW I moved to 13 cm and worked W5LUA, OE9XXI, OE9ERC, SM3AKW and JA4BLC. I did not hear G3LQR. W7GBI, LX1DB and DL6LAU were not QRV. SM3AKW told me that HB9SV was calling me. I heard him (M) copy, but too short to identify callsigns. My biggest problem is frequency calibration and moon aiming without hearing my own echoes. I am also getting interference from noise (10-15 dB) with maxims every 35-50 kHz during evening hours. JA4BLC is very strong now, and the noise was not a problem. Does anybody have experience with a similar noise problem? It looks like wideband modulation - spread spectrum. It covers 2304, 2320 and is strongest at 2424. I will stay on 13 cm in March. I will setup 10 GHz equipment for April - May. Then I plan to mount my 70 cm feed on the same 2.4 m dish and see how many stations I will be able to work on 432. I will be available for skeds on 13 cm on 2 March from 2000 until 2400, then EL is too high for my dish mount, on 3 March from 0300 until 0700, and from 2100 until 0100 on 4 March, from 0400 until 0800, and on 4 March from 2200 until 0130 on 5 March.

WA9FWD

John is still not QRV on 70 cm. The WX has not been good for tower work. He was active in the SSB Contest and QSO'd HB9Q, K5JL, G4CCH and LX1DB on 2-way SSB. He CWN'd OE9ERC and heard others. John has been working on an GS9b amp for 13 cm. He is also working on an GI7b HPA.

WB0GGM

John missed his Feb JA skeds due to Hi VSWR from an ice storm. He did work DL8OBU for initial #84, OH2DG #85 and G4ERG #86, only a partial with KL7HFQ and nil from YO2IS and UA6LGH. He reports hearing ON5OF, PA4PF and G4YTL - worked for #87 after the SW. John will be active on random during the March SW, but is also interested in skeds.

ZS6AXT

Ivo reports -- Since the WX was thunderstorms every night, I did not manage to get on 6 cm during the Feb SW. In fact both SW nights were clear, but quite windy from a cold front. So I went to 13 cm on Saturday and worked SM3AKW (559/559) - very good signals from Carl for the 1st time, then HB9SV with the same reports. The sked listed for WA6PY were well after my Moon window ended. I did not hear anybody else. On Sunday I changed to 23 cm, to give out some points in the SSB Contest, but only one station was heard on SSB. [The contest was already over!] I worked DF4PV, DJ5MN, OE9ERC, OZ6OL, SM2CEW, IK2MMB/HB9, W2UHI, G4CCH, K5JL, KA0Y and K0YW - all with good signals. CWNR was F1PYR and heard was F5PL. We had strong winds, thus it was chopping the signals sometimes. All stations on CW, no SSB, although not much activity in my window. The WX improved on Tuesday 6 Feb. I installed my 6 cm assembly into the dish feed. The main changes are the addition of an IMU circular pol horn and power upgraded to 40 W. The initial position of the horn gave about 0.6 dB Moon noise. My echoes were up to (549). On Wednesday I moved the horn a bit and the result was bit worse. (To change the horn position is quite an exercise, it takes well over an hour!) Since Peter OE9PMJ asked for sked that night, I did not change it. And in the evening I got him straight away, with (559) signals. He gave me (449) for initial #8 on 6 cm. After that I worked Reinhilde, OE9YTV #9. Signals were clear CW, so that I could use my 200 Hz AF filter without problems. However, whether in SSB BW or 200 Hz, signals were excellent even with my low Moon noise. I am not sure whether Peter is also using circular pol. I will see in future QSOs whether there will be now any frequency spreading as happened with linear pol. After final optimization of the horn position I will try to measure how much power is induced into the 6 cm horn from 23 and 13 cm horns and if the level is acceptable, I will leave the 6 cm assembly permanently installed, so that I would have 3 bands (23, 13 and 6 cm). The offset installation of 23 and 13 cm has worked well for me. Change from band to band takes just a minutes. Of course the dish must be repositioned, by some 5 degrees in EL for the offset. The gain loss for dishes of 5 m or more is virtually negligible.

K2UYH

I had planned to operate 432 the 1st evening of the Feb SW and 1296 the 2nd for the SSB Contest. Things do not always turn out the way you plan. On Friday night I checked out my system, and discovered a very high VSWR. In trouble shooting the problem I found that the T-R relay at the dish was not getting voltage. Cable problems are not new as my dish has been up for > 25 years and most of the cables have been in place that long. The T-R relays, however, have always worked. In the dark and cold, (it was raining with some snow mixed in), it would have been very difficult to find the break. I ran a spool of wire from my shack to the feed of the dish and got the relays working in a very temporary way. I then found that my preamp was not working. I had voltage to the feed, so I ran a clip lead to the preamp. I made it on just in time for an extra sked with DL5LF at 0100. I copied

Frank (O) for the 1st few periods, but he did not copy me. After this sked it was near the end of my Eur window and the WX was not that good, so I gave up for the evening. The next day I found one of the control cables had sheared at the back of the dish. I made repairs and had everything back to normal, but had to modify my plans to operate the SSB contest. I had to attend an awards program at the college; I had intended to skip in favor of the contest. It occurred during my Eur window. Fortunately, KC2TA and KB2TIS, whom frequently operate contests with me, were available to keep the station on the air. I was able to operate after 0300 and was hoping for some JA/VK activity that never appeared. We did QSO on 3 Feb at 2101 HB9Q JN (55/53), 2110 F2TU JN (55/43), 2126 LX1DB JN (56/56), 2130 KA0Y EN (55/55), 2132 K5JL EM (55/55), 2134 OE9ERC (56/54) JN, 2140 N2IQ (57/57) FN, 2146 K2DH FN (55/55), 2158 K0YW DM (55/55), 2205 IO G4CCH (55/55), 2248 IO GW3XYW (53/53), 2256 WA9OUU EM (55/53), 2318 K4QI FM (54/54) and 2355 OZ6OL JO (53/52), and on 4 Feb at 0026 W5LUA EM (54/54), 0354 W6HD CM (54/54), 0400 W7BBM DM (549/55) and 0410 W7SZ CN (54/53) for (18x2+1x1)x10 for 370 points.

NETNEWS

by

[G4RGK, DAVID DIBLEY](#)

KB0PYO is collecting the pieces to put his 15' dish on the air. Mark might have it operational by this fall.

YO2IS is looking for Oceania on 70 cm for WAC. Szigy need one more QSO to bring him to initial #150.

VE3BQN is QRT on 23 cm EME. Ted has moved and is retired.

W6HD will be QRV on 3 cm soon.

ON4ANT has a [new email address](#)

VE1ALQ had WX problems and was unable to be active in the SSB Contest. Darrell's address is incorrect. It should be Darrell Ward, 3 Windsong Crt., Brandy Point Est. (optional), Grand Bay-Westfield NB, Canada E5K 2S5.

WA1JOF is working on 6-tube amp for 1296. Don finally worked DJ5MN on Sunday of the SW.

K5WXN worked KL7HFQ and EA8FF for 2 initials on 70 cm EME in Feb.

VE6TA worked 4 stations during SSB Contest. Grant missed his WA9OUU sked and had a partial with HA5SHF (M/-).

W7MEM now has 900 W on 432 and is interested in skeds, but also needs better T-R relays.

W5ZN is working on a 70 cm array.

ON5OF is QRV again, although still in a cast. He worked VK4AFL on Sunday on the SW, but heard nil from AL7OB.

G4YTL is looking for skeds.

RA3LE will be on 432.005 with 8 yagis and 1 kW every weekend looking for random QSOs.

RW3PF is looking for 70 cm skeds.

DK3WDG will active on 432 in the March SW.

W5LUA worked 8 on 23 cm in the SSB Contest plus WA6PY on 2304 and a new one on 10 GHz.

W2UHI reports having fun on the SSB in the contest.

K5JL made 25 QSOs with his new TS-2000 during the SSB Contest.

K2DH fixed his Az drive problem and was on for the SSB Contest and made 18 QSOs.

WA8WZG was iced up also and missed the contest. Tom still needs to fix his El-Az control cables where rodents are feasting.

W4RDI missed the contest.

K5WXN reports good results on 432 in Feb, but lots of QSB from polarity and libration.

K8ISK is interested in getting on 1296 EME from his home QTH.

KA0RYT is temporarily QRT on 70 cm.

KJ7F heard nil in sked with AL7OB.

DJ5MN reports nil from WA8WZG in last SW but did work WA1JOF. He is making progress on 10 GHz.

CT1DMK will be on 70 cm for the March SW, and will move up to 6 cm and 3 cm during the DUBUS Contest.

K4EME worked in Feb on 432 NC1I, SM2CEW, K1FO, DL9NND, DL8OBU, KL7HFQ and AL7OB.

K6IBY is QRV again on 70 cm and will be active on random during the March SW.

UA9FAD QSO'd on 432 in Feb DL8OBU, AL7OB and G4ERG to bring him to initial #140.

PA3CSG has a [new email address](#)

RA3LE worked on 70 cm EA3DXU, OZ6OL, DJ3FI and UA3PTW in Feb.

UA3PTW added on 432 RA3LE, G4YTL, OZ6OL, AL7OB and EA8FF.

FOR SALE

PA5ZBU has sent me (**K2UYH**) a packet of CDs from the **RIO2000 EME Conference**. These are for sale at \$US10. Let me know if you want one and I will get you a copy.

KB0PYO has a matching pair of (2 and 70 cm) amplifiers for sale or possible trade. Both PAs use the 4CX1600u/GS23b and were built by Steve Gross, N4PZ. Both include full metering, blowers (1 on 2 m and 2 on 432), filament and grid supplies. Mark is asking \$1100 for the 2 m amp and \$2000 for the 432 amp plus shipping. He will consider trades. Contact at [Mark's email](#)

W1ZX has for Sale an **MFJ-784 Super DSP filterB** for \$US100+s, **JPS NRF-7 Noise Remover & Audio Filter** for \$US50+s, **HP431B Power Meter with head** for \$US100+s, **HP415E SWR Meter - brown color unit** (a later model unit, not gray in color) for \$US65+s, **Noise Com Noise Diodes NC305**, glass package for \$US33+s, and **AIL Hot-Cold Load Generator, Type 70** (needs some work) for \$US25+s. Call Willie at 301 645 5584 between 2000-2300 EST, FAX 301 645 6853, 24 hrs, or email to [Willie](#)

KA0RYT is looking for Ultem.

OZ9AAR is looking for the design of a 23 cm solid-state amp – see **K3AX's** report.

K3AX has a 225 W 23 cm solid-state PA for sale. See Harry's report in this NL for

details.

VE3BQN has a 23 cm 4 tube PA for sale. Contact Ted at [Ted's email](#)

N2IM is interested in 1296 and 5760 EME and is looking for designs or to buy feeds for these bands. Charlie can be reached at [N2IM's email address](#)

DJ5MN is looking for waveguide for 3 cm.

VE6NA is still looking for 6 tube amp for 23 cm.

W7MEM is looking for 2 SPDT Transco relays or equiv.

TECHNICAL

There has been quite a bit of discussion on the use of circular polarization for Microwave EME incited by S57UUU's paper from the RIO2000 EME Conference. Marko, S57UUU wrote: "It is true that it is harder to make a circular feed than a linear, but it is not that much harder. The losses are negligible. Discrete 90 deg hybrids and cables are definitely not the way to make circular pol on 10 GHz. I would almost bet that the losses can be below 0.01 dB for the 'squeezed tube' polarizer described by W2IMU (reprinted in '96 EME conference proceedings). A PTFE quarter-wave plate (my favorite) has maybe 0.1 dB. The linear orthogonal (commercial WR-75 units from 11 GHz TVRO can be used) and add about 0.1 dB. Using separate feeds for RX/TX as I do

[see - [S57UUU](#).]

spares you even that. So 0.5 dB is an extremely pessimistic value. Even with 0.5 dB, the loss in S/N is less than 1.4 dB typical (signal goes down .5 dB, .5 dB of loss at 300 K gives you 37 K of noise - adding that to 160 K (70 K preamp, 30 K antenna, 60 K Moon/3 m dish - very optimistic values) gives a 0.9 dB increase in noise). 1.4 dB is less than the approx. 2 dB we are losing on average with linear pol because of geometry. I have described this in my Rio paper, also available at <http://lea.hamradio.si/~s57uuu/emeconf/ltsgocir.htm>. Going circular will increase our signals and make them more consistent. When listening to US stations on 3 cm linear pol, I can see quite well the signal dip caused by geometry. I do not believe that significant polarization can happen at the Moon. It is DEPOLARISATION that happens, and that is as detrimental to linear as it is to circular. This is also described in my Rio paper. The bi-static case cannot be that different from the mono-static. The Earth as seen from the Moon is 2 deg across - and that is limb to limb. EU-USA is more like one deg max. So the impact angle is less than one half deg. That is negligible compared to the 7 degs average slope of the lunar terrain

(as determined by RADAR)." Kent, WA5VJB responded: "The problem is that a Right Hand Circular pol (RHCP) signal is reflected off the moon as a Left Hand Circular pol (LHCP). If all 3 cm stations went to RHCP we would all be cross-polarized. A RHCP station can work a LHCP station, but each station would not be able to hear their echoes. I am afraid simple circular polarization is not the answer."

Charlie, G3WDG added: "You would need to have 2 orthogonal probes in the feedhorn, one for LHCP the other for RHCP, much like the IMU horn has, where the polarizing is done with a phase delay section using a waveguide section loaded with screws. I have not seen the Rio paper, and do not know whether a practical feed design has been published. An apology in advance if this paper has discussed the issues I want to raise below. If the polarizer section is done with a length of suitable dielectric, the losses would probably be acceptable. The consequence of this from a practical point of view is that we would likely end up using coax to feed the probes in the horn. This requires transitions to be made if there is any waveguide in the system (e.g. to bring the TWTA power to the feed, or waveguide input preamps). Since most preamps are coaxial input, this is not much of a problem. Where losses would arise, though, is in the protection relay, which you would almost certainly need to switch the preamp over to a 50 ohm load while in TX. I don't think many people would risk relying on the isolation in the feed (difficult to get > 25-30 dB) to stop burning up the preamp. A waveguide switch would be better than a relay, but then 2 transitions would be needed, and it all gets a bit bulky and complex to have at the feed! It was this type of reasoning, including the simplicity of a linear feed, which led to the (almost) universal adoption of LP by 10 GHz EME ops. I think it would be desirable for those seeking to change the standard to try CP out in practice and compare signal levels to linear. If there is ANY significant reduction in system performance I would personally not want to trade that for the only advantage I can see that CP offers, namely the elimination of geometric rotation. I have on occasions had to adjust pol angle, but not that often to justify the extra work that building and installing a CP feed would entail. I do not agree that on average using LP costs us 2 dB as is claimed. It depends on the geometry of the path and can be zero if you can rotate your linear feed. If CP is to be adopted widely (and let us not end up in a mess where some are on linear and others on circular!), then 2 things need to happen. Firstly, practical designs for feeds need to be published so that others can copy them, and secondly the decision needs to be ratified at IARU level, since there is an IARU standard in existence which recommends LINEAR pol for EME use above 3 GHz. The RSGB wrote a paper on this some years ago (which I wrote on behalf of the Microwave Committee of the RSGB). This was adopted (I can't remember at which meeting, but it was at least 5 years ago I think), and is thus the "official" standard. Most EME ops are currently using linear. An unorganized switch to CP would not, in my opinion, be productive in increasing activity as there would be residual uncertainty in peoples' minds to put them off. EME conferences are a

good place to sound out ideas, but I don't think they're a representative forum for reaching decisions of international significance. That's one of the things IARU exists for!" After reading Marko's paper, Charlie wrote: "I have now had a look at the paper. The arguments in the paper are well known and have been aired before when the matter was debated years ago. I personally don't think anything has changed to justify changing the IARU standard. The fact that the proponents have not yet been able to show us how to build a simple horn, I think justifies the comment that there is yet no reason to change. BTW I am a firm supporter of CP on 23 and 13 cm!"

TECHNICAL INFO FOR 23 CM EME QSO

via DSP (FSK)

between W7LHL and W7SZ

A brief description of this QSO that took place on 9 Jan (possibly the 1st of it's kind) was reported by W7SZ in the Feb NL. The system used by both parties was designed by Bob Larkin, W7PUA. The central element is his DSP-10 (144 MHz) transceiver featured in Sept~Nov 99 QST and on his WEB site

[DSP-10 WEBSITE](#)

This multi-mode transceiver is computer controlled and includes waterfall display and EME friendly functions including: AZ/EL display, Auto Doppler shift of Rx, Auto echo display and the FSK mode called PUA43, which was used for this QSO. The system's ability to dig into the noise results from long-term integration, separating signal from noise. With this as background, "PUA43" is the transmission of up to 43 tones, one at a time. Each tone represents an alpha or numeric character. Characters must fall into a spectral bin, adjustable from 2 to 9 Hz wide. Each character's tone is sent for 2 seconds and repeated once or twice per minute for long as one wishes. To further improve reliability, there is a random frequency "stir" to eliminate the effect of birdies. This requires that both sked stations have their computer clocks synchronized. The Frequency accuracy was accomplished via a GPS controller (July 98 QST) steering a 10 MHz VCXO. Output of the OSC is buffered and power divided to feed the DSP-10 transceiver and "lock" the 23 cm txvtr. Unlike many FSK systems, this is not an all-or-nothing copy of text. A process called "message estimation" is used to determine the most likely characters. The confidence level of a received character is noted by it's color and improves with integration time. The improvement over aural copy is yet to be fully established, but various experiments (non- EME) have shown it to be 20 dB

or more, depending on the operators patience. The software to implement these EME functions is still in Beta test. However, Bob is close to a formal release. One problem experienced during this 1st EME QSO was error between predicted and actual Doppler. Both W7LHL and W7SZ had to correct by 9 Hz to be in sync during the contact. This correction was established via the Auto Echo mode prior to QSO. A 2nd "FSK" QSO between W7LHL (10' dish) and W7SZ (12'dish) was completed on 18 Jan. Both stations again using 50 W. However, based on the margin, QSOs should be possible at significantly lower power levels. More tests are planned.

More on [the DSP10 in EME.](#)

FINAL

Other news for Feb include:

OK1DFC has announced a special award open to those who attend the EME2002 in Prague: Johannes Kepler, one of the greatest astronomers spent 12 years of his fruitful life at the court of the emperor Rudolf II in Prague in 17th century. The community of radio amateurs interested in moonbounce communication elected Prague to be the place of their international conference in the year 2002. The organizers of the conference see the parallel of the EME enthusiasts coming to Prague in 21st century with the ancient scientists coming to enjoy the hospitality of the progressive emperor. One of the activities, which shall promote the conference, is the issuing of the Johannes Kepler EME Award. The certificate will be awarded to each licensed radio amateur who attends the conference and fulfils the following conditions: 1. Completing two-way EME contacts on amateur bands (144 MHz, 432 MHz, 1296 MHz, 2.3 GHz, 3.4 GHz, 5.7 GHz and 10 GHz) with total value of 100 points in the period from 1st Jan. 2001 to 30th June 2002. 2. The contacts have following value: Station from Czech Republic = 25 points, Station from Germany = 15 points, Station from Austria = 15 points (The countries, where Kepler lived and worked), 3. It is obligatory to work at least with stations from 2 of the above-mentioned countries, whereas one of them, must be from Czech Republic. The contact with the same station on different band is valid. 4. The final condition is that the applicant must attend the 10th International EME Conference in Prague personally, where the certificates will be awarded on a special ceremony. 5. The station that achieves the maximum points will be awarded a special "Johannes Kepler Trophy". 6. The applicant must present a list of the contacts

with call, date, time and frequency not later then the 15th July 2002 by mail or e- mail to the following address: Antonín Jelínek, OK1DAI, U Dobranskych 5/271, 110 00 Praha 1, Czech Republic or antonin_jelinek@eurotel.cz. For more info on the award and the conference see:

EME 2002 Conference

--Among the technical problems discussed on the 20 m EME net was how to deal with rodents that eat through control cables and coax. Solutions offered included spreading Habanero Chili oil as a repellent. Bonide Hot Pepper Wax Spray available at home and garden centers was offered as an alternative. I have had this problem over the years, and have not had much luck with repellents. I considered putting an ultrasonic noise source at the feed, but never got around to trying it. I did find that trapping and transporting the offending critters always was effective, although often on the late side!

--IW0BET asked me to remind everyone of the ARI's EME MARATHON Contest. This is a cumulative contest based on the sum of all EME QSOs made on all band above 50 MHz during the year (2001) times the total number of DXCC countries worked during the year. The full rules are printed at the end of this NL.

I learned that KA0Y's father passed away this past month. I know Ken has the sympathy of all the EME community at this difficult time.

That the News for this month. Please keep the info coming.

73, Al - K2UYH



WORLD WIDE EME MARATHON 2001

Sponsored by the Italian Radio Amateur Association

SECTIONS: OM and SWL, portable or fixed station.

Date/time: from 0000 1/1/01 to 2400 12/21/01.

Frequency Category

VHF 50 MHz

SWL 50 "

VHF 144 "1A) QRO (erp pwr = or > than 100 kW)

VHF 144 "2A) QRP (erp pwr <100 kw or 1 to 4 ants)

SWL 144 "3A)

UHF 432 "1B) QRO (>50 DBW ERP)

UHF 432 "2B) QRP (<50 DBW ERP)
 SWL 432 "3B)
 SHF 1296 "1C) QRO (>60 DBW ERP)
 SHF 1296 "2C) QRP (<60 DBW ERP)
 SWL 1296 "3C)
 SHF 2304 "
 SWL 2304 "
 SHF 5760 "
 SWL 5760 "
 SHF 10450 "
 SWL 10450 "

(If you don't SPECIFY the category you will be assigned to the QRO category).

The same station cannot be worked more than once per day, but it can be worked in the following days.

VALID QSOs: 2way EME CW/SSB.

SWL: in this category are admitted also OM stations Licensed radio amateurs) but only SWL and not transmitting.

EXCHANGE: callsigns and RST or TMO.

SCORING: 100 points per QSO multiplied by the total number of DXCC countries PLUS 1 (your country is valid for the computation).

EXAMPLE: 20 QSOs and 5 DXCC countries + 1 means 12000 points. $(20 \times 100) \times (5 + 1) = 12000$

PRIZE: the 1st 3 OM and SWL of each band and category.

ENTRIES: postmarked no later than Jan 31st, 2002 to:

IWOBET GIOVANNI ZANGARA

P.O. BOX 36

00100 ROMA CENTRO

ITALIA I

Or via E-mail: iw0bet@amsat.org (attachement)

<http://web.tiscalinet.it/iwobet>

Packet iw0bet@i0tv1

EME MARATHON A.R.I. MANAGER 73' de IWOBET

EME SKEDS

2 MARCH

Time 432.045
 2130z AL7OB -UA6LGH
 2200z AL7OB -HA1YA
 2230z AL7OB -S52CW
 2300z AL7OB -ON5OF
 2330z AL7OB -DJ3FI

3 MARCH

Time	432.035	432.040	432.045	432.070
0000z			AL7OB -PAOPLY	
0300z			WB0GGM-KL7HFQ	7M2PDT-
AL7OB				

0330z		VK4AFL-K4EME	JH1XUJ-
AL7OB			
0400z		JH1XUJ-WBOGGM	JA2TY -
AL7OB			
0530z		AL7OB -N1BUG	
0900z	RW3PF -AL7OB		
1630z	HB9Q -RW3PF		
1700z	DL4MEA-RW3PF		
1730z	DF3RU -RW3PF		
1800z	DK3BU -RW3PF		
1830z	OE5EYM-RW3PF		
1900z	G3LTF -RW3PF		WBOGGM-
UA9FAD			
2000z	K2UYH -RW3PF	WBOGGM-YO2IS	
2030z	K2UYH -DL5LF		
2100z	KD4LT -G4YTL	WBOGGM-UA6LGH	
2130z	KD4LT -PA4FP	K4EME -W1ZX	
2200z	W1ZX -PA4FP	AL7OB -YO2IS	
2230z		AL7OB -OE3JPC	
2300z	PA4FP -KORZ	K4EME -KJ7F	
2330z		AL7OB -PA4FP	
4 MARCH			
Time	432.045		
0230z	AL7OB -KJ7F		
2230z	AL7OB -DK3WG		
2300z	AL7OB -CT1DMK		

3 MARCH		
Time	1296.050	
0200z	VE6TA -WA9OUU	
2130z	WA1JOF-1K2MMB	
2200z	VE6TA -HA5SHF	
2230z	VE6NA -HA5SHF	
2300z	LU8EDR-KOYW	
2330z	WA1JOF-VE6NA	
4 MARCH		
Time	1296.050	1296.060
1900z	DJ5MN -OK1UWA	
1930z	DJ5MN -PA3DZL	
2000z	DJ5MN -WA4NJP	
2030z	DJ5MN -W4RDI	
2100z	DJ5MN -WA8WZG	
2130z	DJ5MN -VE6NA	K2UYH -OK1UWA

3 MARCH			
Time	5760.050	5760.100	5760.150
0600z	WA6PY -JA7BMB		
1600z		RW3BP -F2TU	
1630z		SM4DHN-F2TU	RW3BP -F1ANH
1700z		OK1KIR-F2TU	SM4DHN-F1ANH
1730z		OH2AXH-F2TU	OK1KIR-F1ANH
1800z		OE9ERC-F2TU	OH2AXH-F1ANH
1830z		OE9XXI-F2TU	OE9ERC-F1ANH

1900z		I6PNN -F2TU	OE9XXI-F1ANH
1930z		ZS6AXT-F2TU	I6PNN -F1ANH
2000z		LX1DB -F2TU	ZS6AXT-F1ANH
2030z			LX1DB -F1ANH
2130z		WA5ICW-F2TU	
2200z	WA6PY -LX1DB	W7GBI -F2TU	WA5ICW-F1ANH
2230z	WA6PY -HB9SV		W7GBI -F1ANH
2300z	WA6PY -G3LTF		
2330z	WA6PY -DL6LAU		

EME OPERATING PROCEDURES FOR 432 AND ABOVE BY G3SEK

Netnotes by K1RQG

This information was obtained from: Scott, KD4LT

[Return](#)

[Top Page](#)

[Rein, W6/PA0ZN](#)

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